

We claim:

1. A method of compressing image data into a fixed size memory, the image data being arranged into a plurality of scans of bitstream data, said plurality of scans ordered from a perceptually most significant scan to a perceptually least significant scan, each scan having associated therewith an attribute identifying whether the scans are active or inactive, the method comprising the steps of:
 - determining whether said scans are active or inactive;
 - encoding the determined active scans of bitstream data;
 - transferring the encoded scan bitstream data to the fixed size memory;
 - setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the active scans to inactive.
2. A method according to claim 1, wherein the method comprises the step of:
 - deleting, if the fixed size memory becomes full, the encoded scan bit-stream data of the currently least significant scan.
3. A method according to claim 1, wherein the method comprises the steps of:
 - transforming the image;
 - quantising the image, wherein the quantising step employs bit-shifting operations;
 - and
 - partitioning the quantised image into the plurality of scans of bitstream data.
4. A method according to claim 1, wherein said encoding step comprises the sub-step of:
 - entropy encoding the current scan of bitstream data, if the attribute of the current scan is active; otherwise:
 - proceeding to a next scan of bitstream data.

5. A method as claimed in claim 1, wherein the encoding step comprises the sub-steps of:

accessing a scan of bitstream data for encoding in accordance with a scan map.

5 6. A method as claimed in claim 1, wherein the image data comprises a plurality of quantised 8x8 blocks of DCT transformed image data, and wherein the scans comprise at least for each color component of the quantised DCT transformed image data, two scans for the two least insignificant bitplanes of the group of AC coefficients 1 to 32, and two scans for the two least insignificant bitplanes of the group of AC coefficients 33 to 63.

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7. A method according to claim 1 wherein said scans comprise DC most-significant scans; DC refinement scans; AC most-significant scans and AC refinement scans.

15 8. A method according to claim 7 wherein one of said DC most-significant scans is said perceptually most significant scan and one of said AC refinement scans is said perceptually least significant scan.

20 9. A method according to claim 2 wherein said image data comprises a plurality of color components and said deleting step deletes corresponding encoded scan bit-stream data of more than one said color components.

10. A method of compressing image data into a fixed size memory, the method comprising the steps of:

partitioning the image data into scans of bitstream data, wherein the scans are ordered from a perceptually most significant scan to a perceptually least significant scan and wherein the scans have associated therewith an attribute determining whether each scan is active or inactive;

determining whether said scans are active or inactive;

encoding the determined active scans of bitstream data;

transferring the encoded scan bitstream data to the fixed size memory; and setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the active scans to inactive.

5 11. A method of storing coded image data of an image in a storage of fixed memory size, wherein the image comprises a plurality of pixels and the method comprises the steps of:

arranging the image into a plurality of bands each comprising a predetermined number N of consecutive lines of pixels;

10 buffering and processing the bands one by one in turn, wherein the processing step comprises the following sub-steps for each currently buffered band:

arranging the current band into a plurality of blocks of pixels of size MxM, wherein M is equal to said predetermined number N; and

15 transforming the blocks of pixels to produce respective blocks of transform coefficients;

partitioning the blocks of transform coefficients into a plurality of partitions wherein each partition comprises data from each block of transform coefficients and at least one partition comprises data from at least one but not all bit-planes of each block of transform coefficients, and wherein the plurality of partitions comprise a perceptually significant partition and a perceptually insignificant partition and partitions of varying perceptual significance therebetween, and wherein the partitions have associated therewith an attribute determining whether the partition is active or inactive;

20 entropy coding each active partition; and

25 managing the storing of the said entropy coded partitions in the storage of fixed memory size, wherein during the storing of said entropy coded partitions if it is determined the storage is full a coded least perceptually significant partition currently stored in the storage is overwritten by data from a coded more perceptually significant partition, and the attribute of the overwritten perceptually least significant scan is set to inactive.

12. Apparatus for compressing image data into a fixed size memory, the image data being arranged into a plurality of scans of bitstream data, said plurality of scans comprising a perceptually most significant scan to a perceptually least significant scan,
5 and each scan has associated therewith an attribute identifying whether the scans are active or inactive, the apparatus comprising:

means for determining whether said scans are active or inactive;

means for encoding the determined active scans of bitstream data;

means for transferring the encoded scan bitstream data to the fixed size memory;

10 setting, if the fixed size memory becomes full, the attribute of a currently least significant scan to inactive.

13. Apparatus for compressing image data into a fixed size memory, the apparatus comprising:

15 means for partitioning the image data into scan bitstream data, wherein the scans are ordered from a perceptually most significant scan to a perceptually least significant scan and wherein the scans have associated therewith an attribute determining whether a scan is active or inactive;

means for determining whether said scans are active or inactive;

20 means for encoding the determined active scans of bitstream data;

means for transferring the encoded scan bitstream data to the fixed size memory;

and

means for setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the active scans to inactive.

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14. Apparatus for storing coded image data of an image in a storage of fixed memory size, wherein the image comprises a plurality of pixels and the apparatus comprises:

means for arranging the image into a plurality of bands each comprising a predetermined number N of consecutive lines of pixels;

means for buffering and processing the bands one by one in turn, wherein the processing means comprises:

means for arranging a currently buffered band into a plurality of blocks of pixels of size MxM, wherein M is equal to said predetermined number N; and

5 means for transforming the blocks of pixels to produce respective blocks of transform coefficients;

means for partitioning the blocks of transform coefficients into a plurality of partitions wherein each partition comprises data from each block of transform coefficients and at least one partition comprises data from at least one but not all bit-planes of each 10 block of transform coefficients, and wherein the plurality of partitions comprise a perceptually significant partition and a perceptually insignificant partition and partitions of varying perceptual significance there between, and wherein the partitions have associated therewith an attribute determining whether the partition is active or inactive;

means for entropy coding each active partition; and

15 means for managing the storing of the said entropy coded partitions in the storage of fixed memory size, wherein during the storing of said entropy coded partitions if it is determined the storage is full a coded least perceptually significant partition currently stored in the storage is overwritten by data from a coded more perceptually significant partition, and the attribute of the overwritten perceptually least significant scan is set to 20 inactive.

15. A computer program product comprising machine-readable program code recorded on a machine-readable recording medium, for controlling the operation of a data processing apparatus on which the program code executes to perform a method of compressing image data into a fixed size memory, the image data being arranged into a plurality of scans of bitstream data, said plurality of scans ordered from a perceptually most significant scan to a perceptually least significant scan, each scan having associated therewith an attribute identifying whether the scans are active or inactive, the method comprising the steps of:

determining whether said scans are active or inactive;

encoding the determined active scans of bitstream data;

transferring the encoded scan bitstream data to the fixed size memory;

setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the active scans to inactive.

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16. A computer program product comprising machine-readable program code recorded on a machine-readable recording medium, for controlling the operation of a data processing apparatus on which the program code executes to perform a method of compressing image data into a fixed size memory, the method comprising the steps of:

partitioning the image data into scans of bitstream data, wherein the scans are ordered from a perceptually most significant scan to a perceptually least significant scan and wherein the scans have associated therewith an attribute determining whether each scan is active or inactive;

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determining whether said scans are active or inactive;

encoding the determined active scans of bitstream data;

transferring the encoded scan bitstream data to the fixed size memory; and

setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the active scans to inactive.

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17. A computer program product comprising machine-readable program code recorded on a machine-readable recording medium, for controlling the operation of a data processing apparatus on which the program code executes to perform a method of storing coded image data of an image in a storage of fixed memory size, wherein the image comprises a plurality of pixels and the method comprises the steps of:

arranging the image into a plurality of bands each comprising a predetermined number N of consecutive lines of pixels;

buffering and processing the bands one by one in turn, wherein the processing step comprises the following sub-steps for each currently buffered band:

arranging the current band into a plurality of blocks of pixels of size MxM, wherein M is equal to said predetermined number N; and

transforming the blocks of pixels to produce respective blocks of transform coefficients;

5 partitioning the blocks of transform coefficients into a plurality of partitions wherein each partition comprises data from each block of transform coefficients and at least one partition comprises data from at least one but not all bit-planes of each block of transform coefficients, and wherein the plurality of partitions comprise a perceptually significant partition and a perceptually insignificant partition and partitions of varying 10 perceptual significance therebetween, and wherein the partitions have associated therewith an attribute determining whether the partition is active or inactive;

entropy coding each active partition; and

15 managing the storing of the said entropy coded partitions in the storage of fixed memory size, wherein during the storing of said entropy coded partitions if it is determined the storage is full a coded least perceptually significant partition currently stored in the storage is overwritten by data from a coded more perceptually significant partition, and the attribute of the overwritten perceptually least significant scan is set to inactive.

20 18. A system for compressing image data arranged into a plurality of scans of bitstream data, the plurality of scans being ordered from a perceptually most significant scan to a perceptually least significant scan, the system comprising:

a fixed-size memory;

25 a storage unit for storing information relating to said scans, the information comprising an attribute associated with each scan to identify the scan as active or inactive; and

a processor connected to said fixed-size memory and said storage unit and adapted to compress said image data into said fixed-size memory, wherein said processor:
determines whether said scans are active or inactive;

encodes the determined active scans of bitstream data;
transfers the encoded scan bitstream data to the fixed size memory; and
sets, if the fixed size memory becomes full, the attribute of a currently least
significant scan of the active scans to inactive.